

The opinion in support of the decision being entered today is  
*not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* NORIHIKO SAITO and  
MASAAKI KONDO

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Appeal 2007-3378  
Application 10/715,458  
Technology Center 1700

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Decided: August 31, 2007

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Before CHARLES F. WARREN, PETER F. KRATZ, and  
CATHERINE Q. TIMM, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's  
decision rejecting claims 1-19. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

## I. BACKGROUND

The invention relates to a diagnostic method and apparatus for diagnosing the state of a fuel cell. The method serves to diagnose abnormalities occurring in the operation of the fuel cell (Specification ¶ 0005). Claim 16 illustrates the method on appeal:

16. A diagnostic method for a fuel cell, which is a method for diagnosing a state of the fuel cell, includes the steps of:

(a) operating the fuel cell according to at least one predetermined operation pattern, the predetermined operation pattern to apply at least one predetermined operating condition to change an operational state of the fuel cell;

(b) detecting a change in an operational state of the fuel cell corresponding to each of the operation patterns when the fuel cell is operated according to the at least one predetermined operation pattern; and

(c) diagnosing the state of the fuel cell based on the detected change in the operational state and the at least one predetermined operation pattern.

The apparatus is claimed as an operation device and “portions” performing functions corresponding to the method.

The Examiner relies upon the following prior art references to show unpatentability:

Fuglevand	US 6,096,449	Aug. 1, 2000
Iwasaki	US 6,447,939 B1	Sep. 10, 2002
Yoshizawa	US 2003/0003334 A1	Jan. 2, 2003
Bai	US 6,620,538 B2	Sep. 16, 2003

The Examiner rejects the claims as follows:

1. Claims 1-7, 11, and 16-19 under 35 U.S.C. § 102(b) as anticipated by Fuglevand;<sup>1</sup>
2. Claims 8-10 under 35 U.S.C. § 103(a) as unpatentable over Fuglevand in view of Bai;
3. Claims 12-14 under 35 U.S.C. § 103(a) as unpatentable over Fuglevand in view of Iwasaki; and
4. Claim 15 under 35 U.S.C. § 103(a) as unpatentable over Fuglevand in view of Iwasaki and Yoshizawa.

## II. DISCUSSION

With regard to the anticipation rejection over Fuglevand, Appellants contend that Fuglevand does not disclose operating the fuel cell “according to at least one predetermined operation pattern, the predetermined operation pattern to apply at least one predetermined operation condition to change an operation state of the fuel cell” as recited in claims 1 and 16 (Br. 5). On the other hand, the Examiner contends that the Fuglevand cell operates in the claimed matter (Answer 3). The issue on appeal arising from the contentions of Appellants and the Examiner is: Does a preponderance of the evidence support the Examiner’s finding that Fuglevand describes operating the fuel cell in the claimed manner?

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<sup>1</sup> Appellants’ listing of the rejection as under 35 U.S.C. § 103(a) in the section of the Brief labeled “Grounds of Rejection to be Reviewed on Appeal” (Br. 5) is harmless error as Appellants argue, in the argument section of the Brief, that Fuglevand does not teach each and every limitation of the rejected claims, an argument consistent with the law of anticipation.

Appellants do not present separate arguments for any claim apart from the others and, therefore, we select one claim as representative. We select claim 16.

In order to revolve the issues on appeal, it is first necessary to understand the scope of the claims, and specifically to understand the scope of the phrases “predetermined operation pattern” and “operational state.” To interpret these phrases we seek guidance from the Specification. During examination, “claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827, 1830 (Fed. Cir. 2004).

First, we find that the Specification provides no specific definition for the phrases at issue, nor any clear disavowal of meaning that would be attributed to the phrases by those of ordinary skill in the process control art. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1315-316, 675 USPQ2d 1321, 1329 (Fed. Cir. 2005) (“the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs.”); *American Academy of Science*, 367 F.3d at 1365, 70 USPQ2d at 1831 (holding that an applicant “may demonstrate an intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.”); *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (“Although an inventor is indeed

free to define the specific terms used to describe his or her invention, this must be done with reasonable clarity, deliberateness, and precision.”).

What the Specification describes is a number of different “patterns” which appear to be “predetermined operation patterns” within the meaning of the claim. For instance, the “pattern” may be a predetermined pattern of gas flow (fuel or oxidative gas) supplied to the fuel cell, a pattern of gas supply pressure, a pattern of humidification, a pattern of fuel cell temperature, or a pattern of exhaust gas temperature; to name a few (Specification ¶¶ 0012, 14 and 15). The Specification further describes, among other things, operations involving changing the generated current  $I$  of the fuel cell and detecting the change in the generated voltage (Specification ¶ 0044).

According its plain meaning, the term “operation” refers to any manner of operating or functioning.

Taking in consideration the guidance from the Specification, the plain meaning of “operation” to those of ordinary skill in the art, and breath of the term “operation,” we determine that the claimed “operation pattern” encompasses any pattern the fuel cell operator selects to run the operation, i.e., the pattern of generated current, gas supply flow, gas pressures, and temperatures input into the cell during its operation, for instance. The claim requires the pattern be “predetermined,” i.e., determined before the fuel cell diagnostic method takes place.

The phrase “operational state” is also not defined in the Specification. However, the Specification indicates that there is an operational state of the fuel cell corresponding to each of the operation patterns (Specification ¶ 0009), and further indicates that the operational state may be an output

current and an output voltage of the fuel cell (Specification ¶ 0010 and ¶ 0023), it may be an interterminal voltage and/or cell voltage (Specification ¶ 0011 and ¶ 0023), it may be an internal resistance of the fuel cell (Specification ¶ 0013 and ¶ 0023), it may be a temperature of the fuel cell, or it may be a temperature of an exhaust gas (Specification ¶ 0014 and ¶ 0023). We, therefore, determine that the “operational state of the fuel cell” is any condition of the fuel cell arising from its operation.

Turning to Fuglevand, we find that this reference describes a process of operating a fuel cell as follows:

As best understood by a study of FIG. 3, the fuel cell 10 has an anode and a cathode 52 and 53 which produces electrical power having a *given current and voltage output*. The controller 122 is electrically coupled with the fuel cell 10 and is operable to shunt the electrical current between the anode and the cathode of the fuel cell *under predetermined operational conditions*. As earlier discussed, the shunt controller 122 includes voltage and current sensors 123 and 128 which are disposed in *voltage and current sensing* relation relative to the voltage and current output of the fuel cell 10 and are further electrically coupled with the anode and cathode 52 and 53 of the fuel cell 10. Still further, the shunt controller 122 further comprises an electrical switch, and which is shown herein as a field effect transistor 124. The field effect transistor 124 has open and closed electrical conditions. As will be described in further detail below, the controller 122 upon sensing, by way of the voltage and current sensors 123 and 128, *a given voltage and current output* of the fuel cell 10, adjusts the valve 104 into a predetermined fluid metering relationship relative to the supply of fuel gas 105. Still further, the controller 122 positions the field effect transistor in an open or closed electrical condition, *based upon predetermined performance parameters* for the respective fuel cells 10.

Fuglevand, col. 7, ll. 35-58 (emphasis added).

As seen from the above description, there is a pattern of operation in the process of Fuglevand. That pattern applies in accordance with “predetermined operational conditions” which involve changing the operational state of the fuel cell by shunting the electrical current between the anode and the cathode. It follows that Fuglevand describes operating as required by step (a) of claim 16.

Given the breath of the claim and the description within Fuglevand, we find that a preponderance of the evidence supports the Examiner’s finding that Fuglevand describes operating the fuel cell “according to at least one predetermined operation pattern, the predetermined operation pattern to apply at least one predetermined operation condition to change an operation state of the fuel cell” as recited in claim 16. *See Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983) (“The law of anticipation does not require that the reference ‘teach’ what the subject patent teaches. Assuming that a reference is properly ‘prior art,’ it is only necessary that the claims under attack, as construed by the court, ‘read on’ something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or ‘fully met’ by it.”).

We sustain the rejection of claims 1-7, 11, and 16-19 under 35 U.S.C. § 102(b).

With regard to the other rejections, Appellants merely contend that the additional references do not cure the deficiencies of Fuglevand. For the reasons stated above, we sustain the rejections of claims 8-10 and 12-15 under 35 U.S.C. § 103(a).

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### III. DECISION

The decision of the Examiner is AFFIRMED.

### IV. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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